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10/714,174	11/14/2003	Atsuhiko Sakurai	TI-35272	2911
23494	7590	10/01/2008		
TEXAS INSTRUMENTS INCORPORATED				
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EXAMINER				
SAINT CYR, LEONARD				
ART UNIT		PAPER NUMBER		
2626				
NOTIFICATION DATE		DELIVERY MODE		
10/01/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com

Office Action Summary

Application No.

10/714,174

Applicant(s)

SAKURAI ET AL.

Examiner

LEONARD SAINT CYR

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 06/09/08 have been fully considered but they are not persuasive.

Applicant argues that Dolson in view of Laroche do not teach partitioning the spectrum into a plurality of contiguous spectral bands according to a Bark scale where each spectral band has an extent dependent upon human frequency perception (Amendment, pages 6, and 7).

The examiner disagrees, Dolson teaches "partitioning at least one DFT representation of the sequence into a set of contiguous frequency regions, Such that each contiguous frequency region includes a single significant peak" (col.3, lines 25 - 29). And Laroche teaches " a better sub-band decomposition could be used using frequency bands uniform in a bark scale" (col.3, lines 55 - 58). Thus, Dolson in view of Laroche teach all parts of the claim limitation.

Applicant argues that Dolson in view of Laroche do not teach calculating a phase difference for each of a predetermined number of spectral lines near the dominant spectral line within each spectral band as the phase difference of the corresponding dominant spectral line; calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm (Amendment, pages 7, and 8).

The examiner disagrees, Dolson teaches "Computes the remaining phase values in each contiguous frequency regions...phase values are shifted by subtracting the same number that was added from the phase value for the significant peak. This preserves the linear differences among the phase the phases"; col.5, lines 50 - 60). Computing phase values by subtracting the same number that was added from the phase value for the significant peak implies calculating phase differences for each of a predetermined number of spectral lines near the dominant spectral line, and other spectral lines.

Applicant argues that predetermined number of spectral lines near the dominant spectral line is 4 for a 1024-point spectrum is not made obvious by the combination of Dolson and Laroche (Amendment, pages 8, and 9).

The examiner disagrees, and points out that limitation is obvious over Dolson, since he teaches "adjusting phases of other channels within a particular contiguous frequency region containing the particular significant peak" (col.3, lines 32 - 34). By adjusting phases of other channels within a particular contiguous frequency region; the original phase relationships across channels within the particular contiguous frequency region can be preserved (col.3, lines 34 – 36).

Applicant argues that Dolson in view of Laroche do not teach merging nearby spectral lines that are within a predetermined frequency range (Amendment, pages 9, and 10).

The examiner disagrees, Dolson teaches “the natural sound of a signal that is processed by an analysis step of converting the signal into a sequence of overlapping windowed DFT representations” (col.3, lines 2 – 6). Converting the natural sound into a sequence of overlapping windowed DFT representations implies teach merging nearby spectral lines that are within a predetermined frequency range, since DFT representations of the sound signal are in frequency domain.

Applicant argues that Dolson in view of Laroche do not teach adjusting boundaries of spectral bands to maintain important frequency groups within the same spectral band (Amendment, pages 10 – 12).

The examiner disagrees, Dolson teaches “the borders between contiguous frequency regions may be selected in a number of ways...the channel midway between two significant peaks becomes the border between the corresponding contiguous frequency regions” (col.5, lines 20 – 24). Selecting borders between contiguous frequency regions in different ways, implies adjusting boundaries of spectral bands to maintain important frequency groups within the same spectral band, since the channel midway between two significant peaks can become the border between the corresponding contiguous frequency regions.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1 – 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dolson (US Patent 6,112,169) in view of Laroche (US Patent 6, 766,300).

4. Regarding claims 1, and 6, Dolson discloses a method of converting an input digital audio signal into an output digital audio signal having a modified time scale comprising the steps of:

calculating a discrete Fourier transform of first equally spaced, overlapping time windows having a first overlap amount of the input digital audio signal("windowed DFT to each overlapping"; col. 5, lines 3 - 6);

partitioning the spectrum into a plurality of contiguous spectral bands , where each spectral band has an extent dependent upon human frequency perception ("contiguous frequency regions"; col. 5, lines 3-6);

identifying a dominant spectral line having the greatest magnitude within each spectral band ("identification of significant peaks within a DFT spectrum; and division of the DFT spectrum into contiguous frequency regions"; col.3, lines 49 - 52);

calculating a phase difference for the dominant spectral line of each spectral band by a phase vocoder algorithm ("phase modification ... for each significant peak"; col. 5, lines 34-37);

calculating a phase difference for each of a predetermined number of spectral lines near the dominant spectral line within each spectral band as the phase difference of the corresponding dominant spectral line; calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm ("phase values are

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shifted by subtracting the same number that was added from the phase value for the significant peak"; col.5, lines 50 - 60); and

calculating an inverse discrete Fourier transform resulting in equally spaced, overlapping time windows having a second overlap amount employing the calculated phase difference for each spectral line, the second overlap selected having a ratio to the first overlap amount to achieve a desired time scale modification (see col. 5, lines 62-65).

However, Dolson does not specifically teach partitioning the spectrum into a plurality of contiguous spectral bands according to a Bark scale.

Laroche teaches that a better sub-band decomposition could be used using frequency bands uniform in a bark scale (col.3, lines 55 - 58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to used bark scale frequency division as taught by Laroche in Dolson, because that would help better divide the spectrum in better uniform frequency bands.

As per claims 2, and 7, Dolson in view of Laroche do not specifically teach that the predetermined number of spectral lines near the dominant spectral line is 4 for a 1024-point spectrum. However, since Dolson teaches adjusting phases of other channels within a particular contiguous frequency region containing the particular significant peak (col.3, lines 32 - 34). One having ordinary skill in the art at the time the invention was made to consider a predetermined number of spectral lines near the

dominant spectral line in Dolson in view of Laroche, so that original phase relationships across channels within the particular contiguous frequency region can be preserved (col.3, lines 34 – 36).

Regarding claims 3, and 8, Dolson further discloses merging nearby spectral lines that are within a predetermined frequency range of each other prior to calculating the phase difference ("a sequence of overlapping windowed"; col.3, lines 8 – 12).

Regarding claims 4, and 9, Dolson further discloses said that step of partitioning the spectrum into a plurality of contiguous spectral bands employs predetermined spectral bands unrelated to the digital audio signal (figs. 4 – 6; col.5, lines 42 - 49).

Regarding claims 5, and 10, Dolson further discloses that step of partitioning the spectrum into a plurality of contiguous spectral bands includes adjusting boundaries of spectral bands to maintain important frequency groups within the same spectral band ("the borders between contiguous frequency regions may be selected in a number of ways"; col. 5, lines 20-24).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD SAINT CYR whose telephone number is (571) 272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LS

09/26/08

/Richemond Dorvil/

Supervisory Patent Examiner, Art Unit 2626